

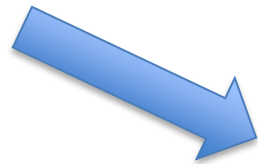
# Recent developments in SUS and NTS of airborne CECs

Laura Röhler, Pernilla Bohlin Nizzetto, and Martin  
Schlabach

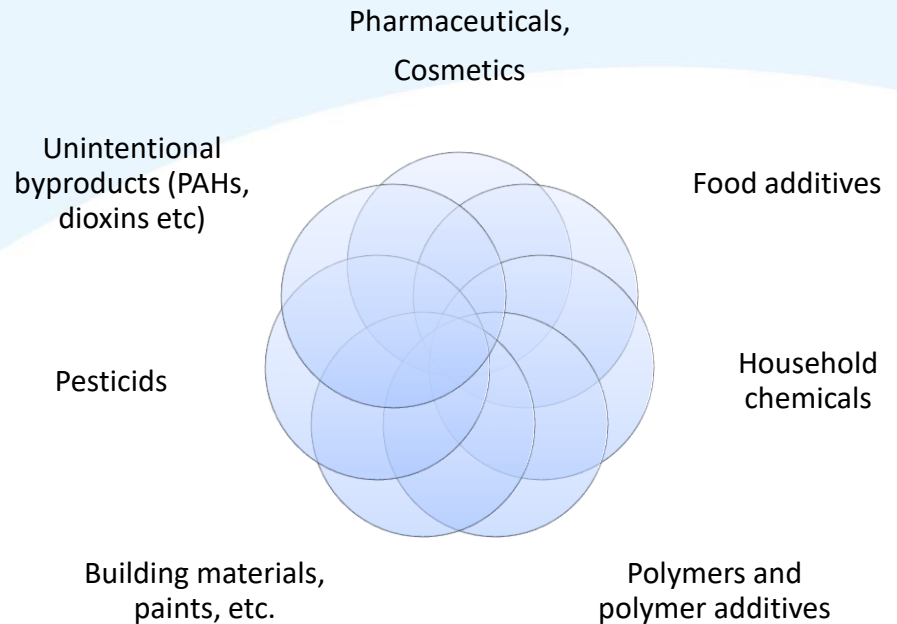
NILU&NMBU

# Daily exposure to chemical cocktail

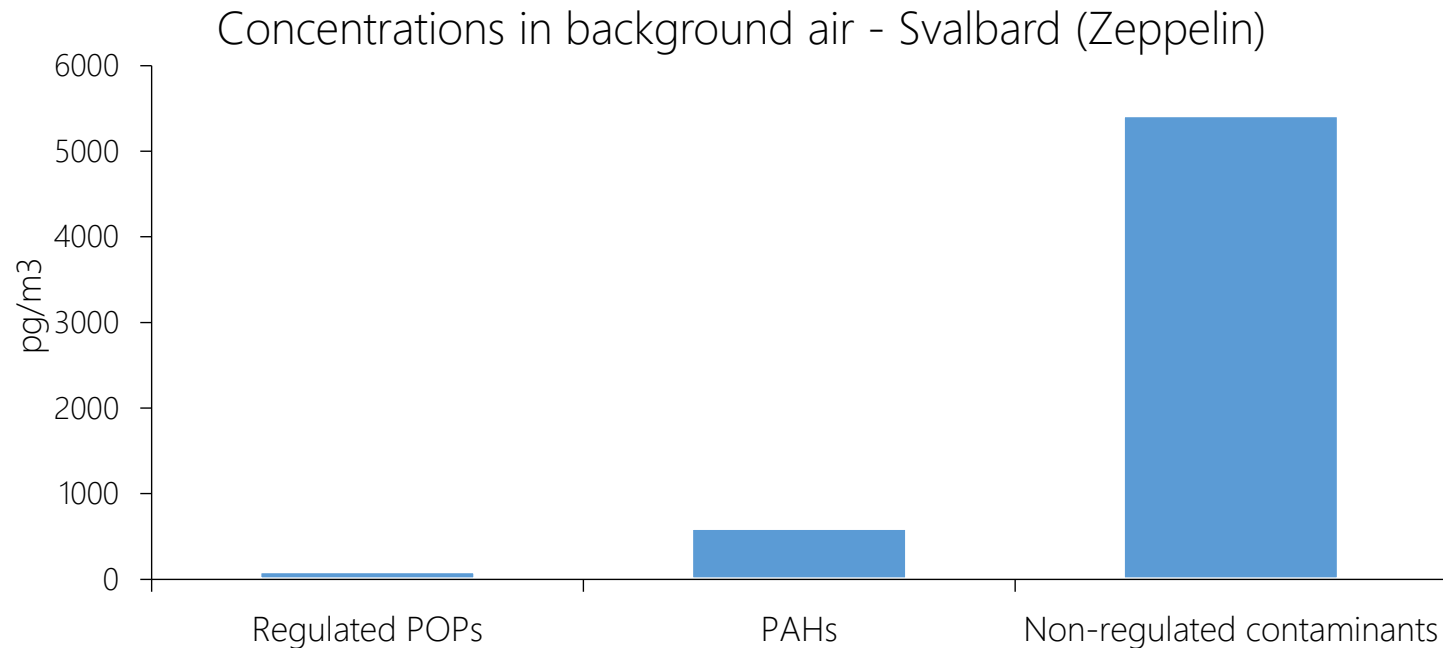
- Modern live based on chemicals
- Increasing number of chemicals
- Complex mixtures
- Most chemicals are mobile
- Find their way to environment and humans
- Some of these chemicals might be harmful to health or environment and therefore of concern



Contaminants of emerging concern (CECs)



# Chemicals of emerging concern (CECs)



# NORMAN Network

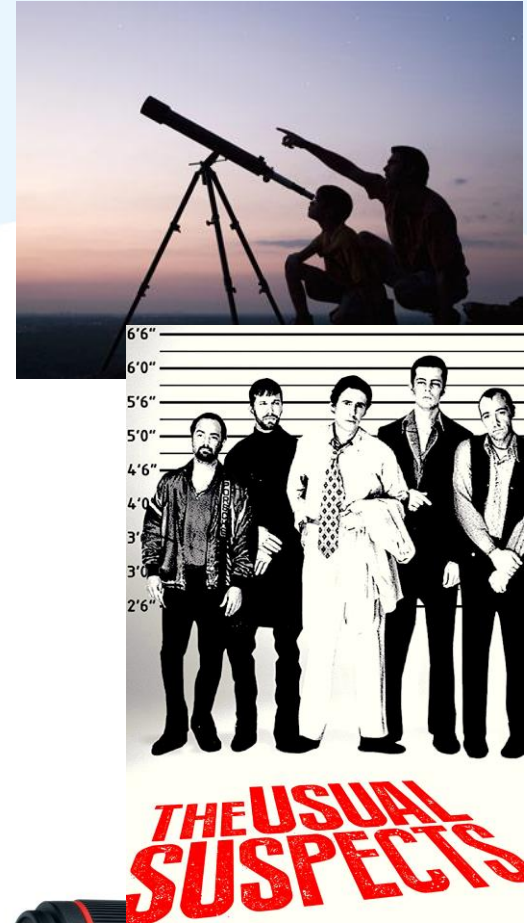


Network of reference laboratories, research centres and related organisations for the monitoring of emerging environmental substances

- Workshops on analysis and effects of CECs
- Databases on monitoring data and effects of CECs
- Intercalibrations and standardization of methods for CECs
- Information of policy makers on CECs
- NILU and NIVA are members of the Steering Committee of NORMAN

# Analytical approaches

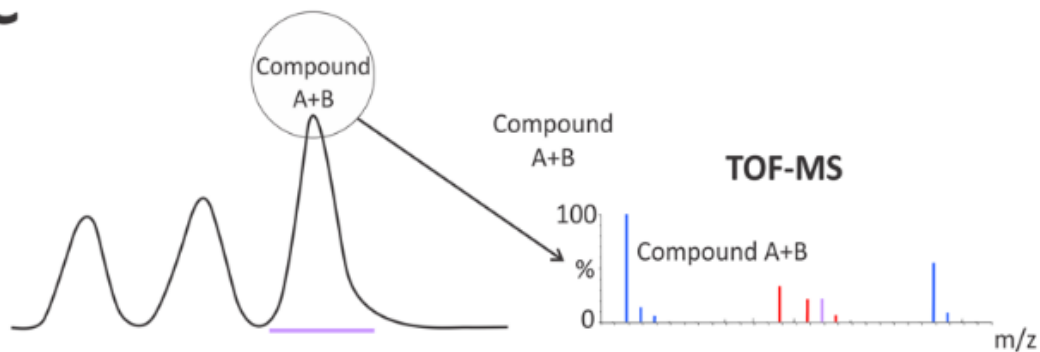
- Traditional – *targeted* screening approach
  - HM and legacy POPs
  - CECs like PFAS, siloxanes or PFR
  - But time consuming, specialised method for each compound
- *Suspect* screening approach (SUS)
  - General approach for many CECs, possible to be used in monitoring
- *Non-targeted (non-specific)* screening approach (NTS)
  - Specialized approach, not for routinely monitoring



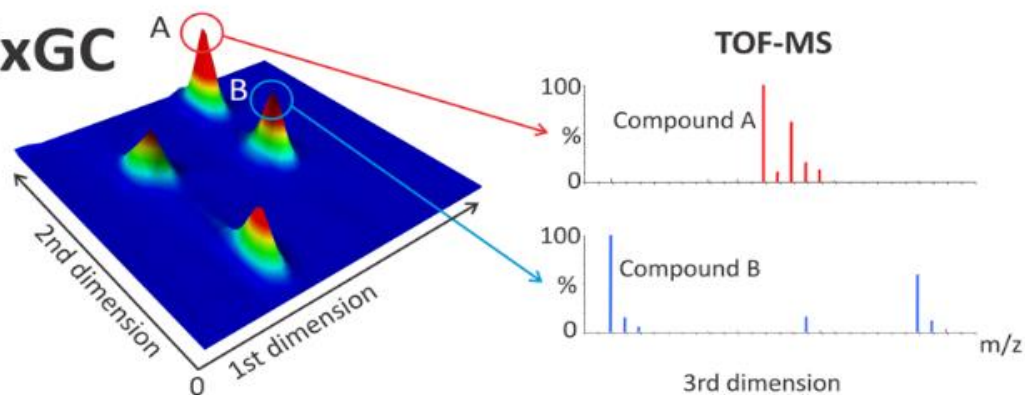
# High-vol air sampling & GCxGC-LRMS



**GC**



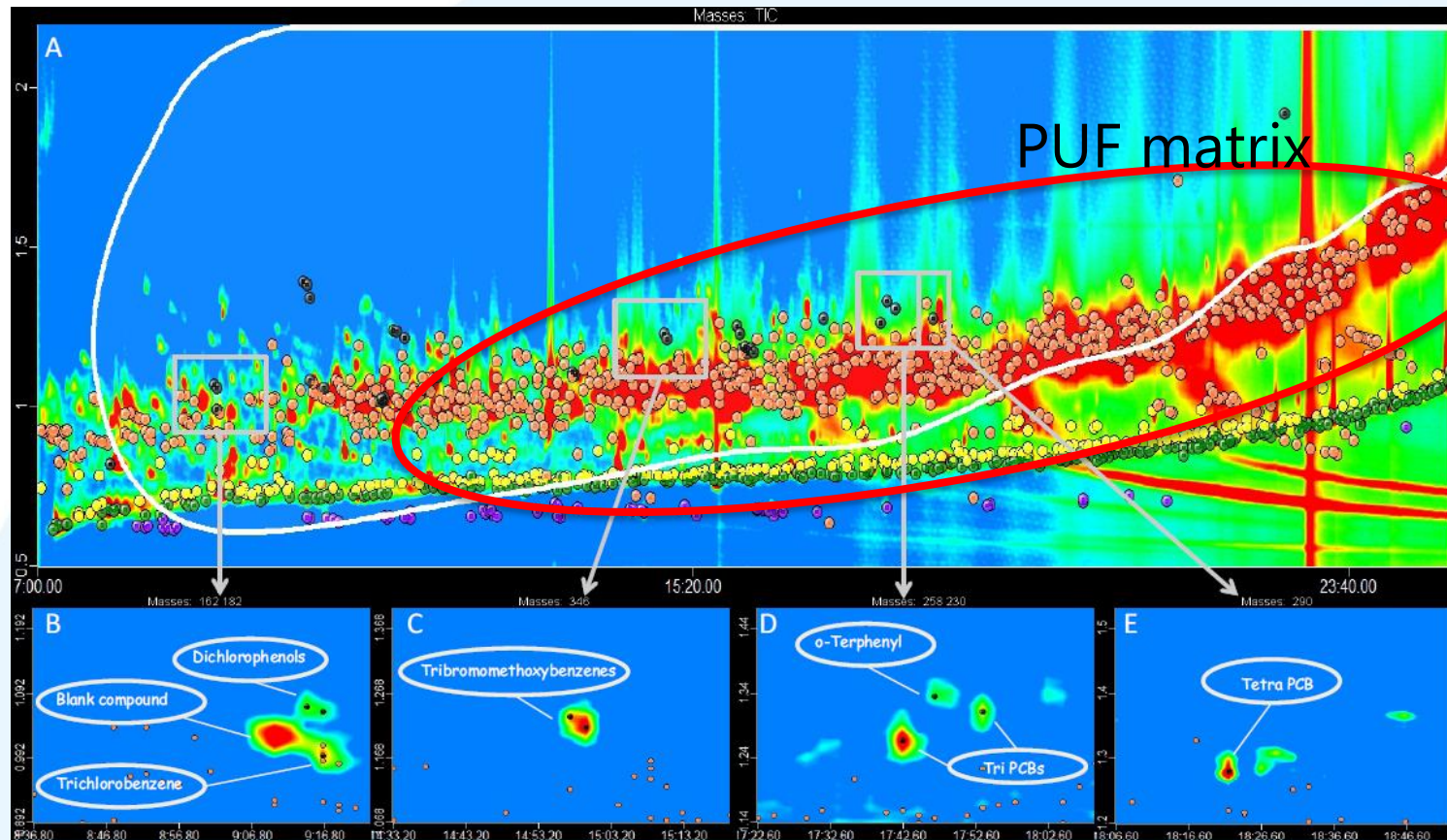
**GCxGC**





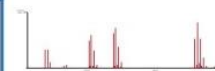
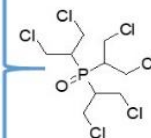
# Analytical challenges

GCxGC plot: non-target analysis of air sample (PUF/PUF)



Norman

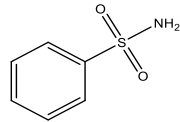
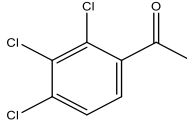
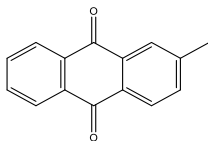
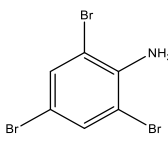
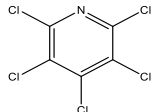
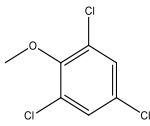
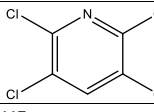
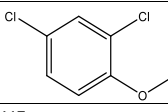
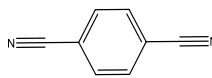
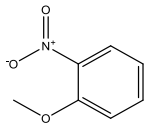
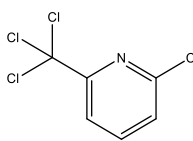
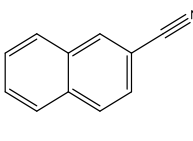
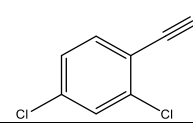
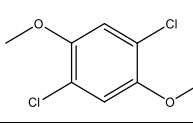
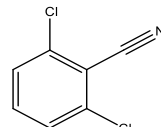
## Postacquisition Data Treatment Workflow for LRMS data





# Results of GCxGC-LRMS based SUS/NTS

Confidence level	Compounds classified
L0	6
L1	57
L2	89
L3	241
L4	65
L5	1200

Benzenesulfonamide (BSA)/ 98-10-2		2',3',4'-Trichloroacetophenone / 13608-87-2	
	GFF		PUF
2-Methyl-9,10-Anthraquinone/ 84-54-8		2,4,6-Tribromoaniline / 147-82-0	
	GFF		PUF
Pentachloropyridine/ 2176-62-7		2,4,6-Trichloroanisole 87-40-1	
	PUF		PUF
2,3,5,6-Tetrachloropyridine/ 2402-79-1		2,4-Dichloroanisole 553-82-2	
	PUF		PUF
1,4-Benzenedicarbonitrile (Terephthalonitrile)/ 623-26-7		2-Nitroanisole/ 91-23-6	
	PUF		PUF
2-Chloro-6-(trichloromethyl)pyridine (Nitrapyrin)/ 1929-82-4		2-Naphthalenecarbonitrile/ 613-46-7	
	PUF		PUF
2,4-Dichlorobenzonitrile/ 6574-98-7		1,4-dichloro-2,5-dimethoxybenzene (chloroneb)/ 2675-77-6	
	PUF		PUF
2,6-Dichlorobenzonitrile (dichlorobenil)/ 1194-65-6			
	PUF		

Thank you for your  
attention!

**Questions?**



Norsk institutt  
for luftforskning